

Claims

What is claimed is:

1. An electro-optic apparatus comprising:

a first substrate;

a second substrate attached to the first substrate with a predetermined gap disposed therebetween by a sealing member; and

an electro-optic-material layer held in an area partitioned by the sealing member within the gap, wherein first transparent driving electrodes and second transparent driving electrodes formed on the first substrate and the second substrate, respectively, apply an electric field to the electro-optic-material layer,

the first substrate including:

mounting terminals formed at an extending area over the second substrate;

first inter-substrate electric-connection terminals formed at an area where the first substrate and the second substrate overlap;

first wiring patterns connecting the mounting terminals to the first driving electrodes; and

second wiring patterns connecting the mounting terminals to the first inter-substrate electric-connection terminals,

the second substrate including:

second inter-substrate electric-connection terminals opposed to the first inter-substrate electric-connection terminals,

an optical reflection film in which light transmission holes are formed at part of an area overlapping with an area where the first driving electrodes and the second driving electrodes are opposed is formed at a lower-layer side of the first

driving electrodes of the first substrate, and a color filter layer is formed between the optical reflection film and the first driving electrodes, and

the second wiring patterns have metal wiring at least partially metal wiring formed of the same metal film as the optical reflection film.

2. An electro-optic apparatus according to Claim 1, wherein the mounting terminals and the first inter-substrate electric-connection terminals are formed of a transparent electrically-conductive film constituting the first driving electrodes.

3. An electro-optic apparatus according to Claim 1, wherein, between the color filter layer and the first driving electrodes, a transparent organic insulating film is formed except at least at areas where the first inter-substrate electric-connection terminals and the mounting terminals are formed, and

an inorganic insulating film is formed over almost all of the first substrate between the organic insulating film and the first driving electrodes.

4. An electro-optic apparatus according to Claim 3, wherein the metal wiring for the first wiring patterns and the second wiring patterns is disconnected at an area exposed from a substrate side of the second substrate.

5. An electro-optic apparatus according to Claim 3, wherein the metal wiring for the first wiring patterns and the second wiring patterns is also formed at an area exposed from a substrate side of the second substrate, and

the organic insulating film is formed at an upper-layer side of the metal wiring at the exposed area.

6. An electro-optic apparatus according to claim 1, wherein the first wiring patterns extend, in an area where the mounting terminals are formed, from the mounting terminals arranged at a center area thereof toward an opposed substrate side to connect to the first driving electrodes,

the second wiring patterns extend, in the area where the mounting terminals are formed, from the mounting terminals arranged at both-side areas thereof, outside the area where the first wiring patterns are formed, to connect to the first inter-substrate electric-connection terminals arranged along substrate sides at both-side areas of an image display area, and

the second driving electrodes extend in a direction intersected with the first driving electrodes in the image display area to connect to the second inter-substrate electric-connection terminals.

7. An electro-optic apparatus according to claim 1, wherein a base electrically-conductive film is formed at a lower-layer side of an area where at least the metal film constituting the optical reflection film is formed.

8. An electro-optic apparatus according to claim 1, wherein an electrically-conductive protection film is formed at an upper layer of an area where the metal film constituting the optical reflection film is formed.

9. An electro-optic apparatus according to Claim 7, wherein holes are formed in the base electrically-conductive film at areas overlapped with the light transmission holes.

10. An electro-optic apparatus according to claim 7, wherein the base electrically-conductive film is also formed at a lower-layer side of the mounting terminals and at a lower-layer side of the first inter-substrate electric-connection terminals.

11. An electro-optic apparatus according to claim 1, wherein the optical reflection film is made from one of a silver alloy film, an aluminum alloy film, and an aluminum film.

12. An electro-optic apparatus according to claim 7, wherein the optical reflection film has a two-laminated-layer structure in which an aluminum alloy film or an aluminum film serves as the upper layer, and a molybdenum film or a molybdenum alloy film serves as the lower layer serving as an intermediate layer between the upper layer and the base electrically-conductive film.

13. An electro-optic apparatus according to claim 1, wherein the metal film constituting the optical reflection film is also formed at the mounting terminals and the first inter-substrate electric-connection terminals.

14. An electro-optic apparatus according to Claim 3 wherein the mounting terminals and bumps for a driving IC are electrically connected through

electrically-conductive particles scattered in a resin component, and the electrically-conductive particles pass through the inorganic insulating film formed at the mounting terminals.

15. An electro-optic apparatus according to Claim 3, wherein the first inter-substrate electric-connection terminals and the second inter-substrate electric-connection terminals are electrically connected through electrically-conductive particles scattered in a resin component, and the electrically-conductive particles pass through the inorganic insulating film formed at a lower-layer side of the first inter-substrate electric-connection terminals.

16. An electronic unit comprising an electro-optic apparatus according to Claim 1, as a display section.